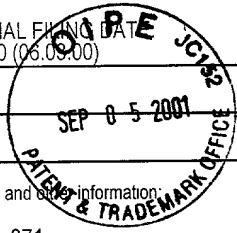


U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	ATTORNEY'S DOCKET NUMBER: 01P101:RC:SB  U.S. APPL. NO. (When known, see 37 CFR 1.53) <b>09/914783</b>
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INTERNATIONAL APPLICATION NO.: PCT/AU00/00156	INTERNATIONAL FILING DATE: 6 MARCH 2000 (06.03.00)	PRIORITY DATE CLAIMED: 5 MARCH 1999 (05.03.99)
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TITLE OF INVENTION: HEAT REFLECTION FOOTWEAR DEVICE

APPLICANT(S) FOR DO/EO/US: Peter O'BRIEN



Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1.  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
  2.  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
  3.  This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
  4.  A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
  5.  A copy of the International Application as filed (35 U.S.C. 371(c)(2))
    - a.  is transmitted herewith (required only if not transmitted by the International Bureau).
    - b.  has been transmitted by the International Bureau. (see attached copy of PCT/IB/308)
    - c.  is not required, as the application was filed in the United States Receiving Office (RO/US).
  6.  A translation of the International Application into English (35 U.S.C. 371(c)(2)).
  7.  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
    - a.  are transmitted herewith (required only if not transmitted by the International Bureau).
    - b.  have been transmitted by the International Bureau.
    - c.  have not been made; however, the time limit for making such amendments has NOT expired.
    - d.  have not been made and will not be made.
  8.  A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
  9.  An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
  10.  A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
- Item 11. to 16. below concern document(s) or information included:
11.  An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
  12.  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
  13.  A **FIRST** preliminary amendment.
  14.  A **SECOND** or **SUBSEQUENT** preliminary amendment.
  15.  A substitute specification.
  16.  A change of power of attorney and/or address letter.
  17.  Other items or information: INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT/IPEA/409), INTERNATIONAL SEARCH REPORT (PCT/ISA/210), APPLICATION DATA SHEET, ABSTRACT

U.S. APPLICATION NO. (known to USPTO) <b>09/914783</b>	INTERNATIONAL APPLICATION NO PCT/AU00/00156	ATTORNEY'S DOCKET NO. 01P101:RC:SB
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CALCULATIONS PTO USE ONLY

17.  The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):**  
 Neither international preliminary examination fee (37 CFR1.482) nor international search fee (37 CFR1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$ 1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$ 860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$ 710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$ 690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$ 100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =** \$ 1000.00

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	22 - 20 =	2	X \$18.00	\$	36.00
Independent claims	1 - 3 =	0	X \$80.00	\$	
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)					+ \$270.00

**TOTAL OF ABOVE CALCULATIONS =** \$ 1036.00

Reduction of 1/2 for filing by small entity, if applicable. Applicant claims Small Entity Status under 37 CFR 1.27. + \$ 518.00

**SUBTOTAL =** \$ 518.00

Processing fee of \$130 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR1.49(f)).

**TOTAL NATIONAL FEE =** \$ 518.00

Fee for recording the enclosed assignment (37 CFR1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property + \$ 40.00

**TOTAL FEES ENCLOSED =** \$ 558.00

Amount to be refunded:

charged:

- a.  A check in the amount of \$ **558.00** to cover the above fees is enclosed.
- b.  Please charge my Deposit Account No. **25-0120** in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c.  The Commissioner is hereby authorized to charge any additional fees which may be required by 37 CFR 1.16 and 1.17, or credit any overpayment to Deposit Account No. **25-0120**. A duplicate copy of this sheet is enclosed.

SEND ALL CORRESPONDENCE TO:

YOUNG & THOMPSON  
 745 South 23rd Street  
 2nd Floor  
 Arlington, VA 22202  
 (703) 521-2297  
 facsimile (703) 685-0573

September 5, 2001

By *Benoit Castel*  
 Benoit Castel  
 Attorney for Applicant  
 Registration No. 35,041

**Customer Number: 000466**

## PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Peter O'BRIEN

Box Non-fee Amendment

Serial No. (unknown)

GROUP

Filed herewith

Examiner

HEAT REFLECTION FOOTWEAR DEVICE

PRELIMINARY AMENDMENT

Commissioner for Patents

Washington, D.C. 20231

Sir:

Prior to the first Official Action and calculation of the filing fee, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 4-11, 13, 16-17, 19 and 21 as follows:

--4.(Amended) The device according to claim 2 wherein the powder or particulate is between 10 to 15% of the mixture.

5.(Amended) The device according to claim 2 wherein the powder or particulate is of paint grade particle size.

6.(Amended) The device according to claim 2 wherein the mixture having a quantity of fluid so that it is flowable.

RECEIVED





Peter O'BRIEN

REMARKS

Claims 4-11, 13, 16-17, 19 and 21 were amended to correct multiple dependency. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

Respectfully submitted,

YOUNG & THOMPSON

By *Benoît Castel*

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September 5, 2001

10/20/01 10:24:00 AM

"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

Claims 4-11, 13, 16-17, 19 and 21 have been amended as follows:

4. (Amended) The device according to claim 2 ~~or 3~~ wherein the powder or particulate is between 10 to 15% of the mixture.

5. (Amended) The device according to ~~any one of claims 2 to 4~~ claim 2 wherein the powder or particulate is of paint grade particle size.

6. (Amended) The device according to ~~any one of claim 2 to 5~~ wherein the mixture having a quantity of fluid so that it is flowable.

7. (Amended) The device according to ~~any one of claims 2 to 6~~ claim 2 wherein the heat reflective powder or particulate is one or a combination of two or more material selected from titanium dioxide, zirconium and zinc oxide.

8. (Amended) The device according to ~~any one of claims 2 to 7~~ claim 2 wherein the powder or particulate is between 10 to 50% of the mixture.

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9. (Amended) The device according to ~~any one of claims 2 to 8~~ claim 3 wherein the powder or particulate is of paint grade particle size.

10. (Amended) The device according to ~~any one of claims 2 to 9~~ claim 2 wherein the thickening agent is between 30 to 90% of the mixture.

11. (Amended) The device according to ~~any one of claims 1 to 10~~ claim 1 wherein the thickening agent is one or a combination of two or more materials selected from bentonite, attapulite and celluloses.

13. (Amended) The device according to ~~any one of claims 1 to 12~~ claim 1 wherein the device is formed to be generally in the shape of a foot and the sac extending from about the heel region to about the toe or ball region of the foot.

16. (Amended) The device according to ~~any one of claims 13 to 15~~ claim 13 wherein the device is reversible so that either surface of the first and second layers can be used.



17.(Amended) The device according to ~~any one of claims 13to 16~~ wherein the layers are sealingly joined around the edges thereof by adhesive, fusion, welding or any other known technique.

19.(Amended) The device according to claims ~~17or 18~~ wherein the sac is also formed during joining of the edges and the sac extending to about the ball region.

21.(Amended) The device according to ~~any one of claims 1 to 20~~claim 1 wherein the device is a sole or a removable inner sole for the footwear.

HEAT REFLECTION FOOTWEAR DEVICETECHNICAL FIELD OF THE INVENTION

THIS INVENTION relates to a heat deflection device for footwear and in particular but not limited to an inner sole having a sac filled with a flowable slurry containing a heat deflection material for reducing heat transfer from undersole to foot of a wearer and providing a therapeutic effect.

BACKGROUND OF THE INVENTION

Footwear in general has a sole made of rubber, leather or an synthetic or any other suitable material. The sole conducts or convects heat into the interior of the footwear. In warm climate or when it is warm in other regions the heat from the ground is transferred to the foot of a wearer through the sole. As footwear is usually shaped to enclose substantially all of the feet and is generally fairly well insulated against the environment the temperature inside the footwear quickly builds up to a level which is uncomfortable.

As human feet and hands have a relatively higher number of sweat glands per square centimetre than other parts of the body the inside of the footwear also quickly becomes damp due to sweating.

The temperature and dampness inside the footwear promote growth of algae and the footwear becomes unhygienic and usually also has an unpleasant odour. They also affect work efficiency. As much of the heat travels upward to the head and people tend not to concentrate well in this situation.

In recent years many sports such as tennis, hockey and soccer are played on synthetic surfaces, the surface temperatures of which can be as high as 60 to 70 degrees centigrade. The temperature inside the players' footwear is even higher. Long distance runners are also affected by high temperatures in footwear. Many players cannot perform to the level they are capable in this environment. Injuries through sore feet and blisters are also prominent.

An inner sole worn in footwear has been available for sometime as a source of comfort to the wearer. It is usually made of an absorbent foam material. But this inner sole does not reduces the temperature in the footwear and it does not take

long for it to be saturated with sweat and thereafter the wearer continues to suffer the above discomfort.

More recently footwear with ventilation openings for cooling its interior has been introduced into the market. These openings however result in weakened zones and the strength of the footwear is greatly compromised.

#### OBJECT OF THE INVENTION

An object of the present invention is to alleviate or to reduce to a certain degree one or more of the present invention.

#### SUMMARY OF THE INVENTION

In one aspect therefor the present invention resides in a heat reflection device for footwear, the device including a first layer of fluid-impervious material, a second layer of fluid-impervious material and a sac arranged between the first and second layers, the sac containing a heat reflective material therein. In use the device is positioned in relation to the sole of the footwear so the at least some heat conducted or conected through the sole is reflected away from a foot of a wearer of the footwear.

It is preferred that the heat reflective material is a mixture having a quantity of heat reflective powder or particulate and a quantity of thickening agent. The mixture may also have a quantity of fluid so that it is flowable.

The heat reflective powder or particulate may be one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide. Preferably the powder or particulate are between 10 to 50% of the mixture. More preferably they are of paint grade particle size.

The thickening agent may be one or a combination of two or more selected from bentonite, attapulite and celluloses. Preferably the agent is between 30 to 90% of the mixture. The thickening agent effects in distributing the powder or particulate more evenly in the sac.

The fluid may be added to a quantity so that the mixture is of a suitable flow quality. The flow quality allows the device to massage the foot when the sac is pressed. This has a therapeutic effect on the user.

The device is generally in the shape of a foot. The sac may extend from about the heel region to about the toe region but typically extends to about the ball region of the foot.

Desirably the first and second layers are flexible and made of any suitable impervious material. Polyurethane and other plastic materials are preferred for the layers of the device. More desirably the device is reversible so that either surface of the first and second layers can be used.

The layers are generally foot shaped and can be sealingly joined around the edges by adhesive, fusion, welding or any other known technique. It is preferred that radio frequency (RF) welding is employed for the joint. Desirably the sac is also formed during joining of the edges. Where the sac is to extend to about the ball region an additional joint may extend substantially laterally in the ball region.

The device may be a sole or a removable inner sole for the footwear.

Advantageously the sole or the inner sole has spaced markings for different shoe sizes so that it can be trimmed according to a marking for desired size.

In order that the present invention can be more readily understood and be put into practical effect reference will now be made to the accompanying drawings which illustrate one preferred embodiment of the invention and wherein:

#### BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is a top plan view of an inner sole according to the invention; and Figure 2 is a bottom plan view of the inner sole shown in Figure 1.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 and 2 which illustrate an inner sole 10 according to the invention. As can be seen, the inner sole 10 is substantially foot shaped and has superimposed together a first layer 12 and a second layer 14 which are sealingly joined by RF welding around their edges 16 except for a small part 18 of the edges under the heel region. The purpose of the unsealed part will be described later. The layers 12 and 14 in this embodiment are made of a 0.05mm thickness, clear polyurethane material which is impervious to water.

A further joint 20 across the ball region defines a sac 22.

The sole 10 has shoe size markings 24 forward of the sac 22 so that it can be trimmed to fit a particular shoe. In this embodiment the markings 24 are also formed by RF welding resulting in raised ribs 26 between adjacent markings 24. The raised ribs 26 are provided on the surface of layer 12 only in this embodiment. But if desired they can be provided on both layers 12 and 14.

The device 10 is reversible as either the surface of layer 12 or the surface of layer 14 can be arranged to contact a wearer's foot.

In manufacturing a mixture of 30-60% bentonite, 10-30% titanium dioxide and about 60% water is poured into the sac 22 through the unsealed part 18. Thereafter part 18 is RF welded so that the sac 22 is fluid tight. The titanium dioxide used for this mixture is paint grade sized powder.

A comparative laboratory test by measuring the temperatures on the surfaces of a known foamed rubber inner sole and the sole of the present invention as described in the above embodiment on a hot plate preheated to 60 degrees Centigrade reveals the following results:

Temp. of hot plate (°C)	Temp. at rubber inner sole surface (°C)	Temp. at inner sole of invention (°C)
60.0	41	34

The above test was carried out when the room temperature was 23 °C and it clearly shows a substantially reduced temperature at the surface of the device 10.

The inventor has found that by increasing the quantity of titanium dioxide in the mixture to 46% the device 10 will become 70% reflective as compared to 43% reflective for the above embodiment.

As the mixture in the sac 22 is flowable the device 10 in use has moving high and low contact points with the foot. This provides a therapeutic massaging effect.

Whilst the above has been given by way of illustrative example of the present invention many variations and modifications thereto will be apparent to



CLAIMS

1. A heat reflection device for footwear, the device comprising a first layer of fluid-impervious material, a second layer of fluid-impervious material and a sac arranged between the first and second layers, the sac containing a heat reflective material therein; in use the device is positioned in relation to the sole of the footwear so that at least some heat conducted or convected through the sole is reflected away from a foot of a wearer of the footwear.
2. The device according to claim 1 wherein the heat reflective material is a mixture having a quantity of heat reflective powder or particulate and a quantity of thickening agent.
3. The device according to claim 2 wherein the heat reflective powder or particulate is one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide.
4. The device according to claim 2 or 3 wherein the powder or particulate is between 10 to 50% of the mixture.
5. The device according to any one of claims 2 to 4 wherein the powder or particulate is of paint grade particle size.
6. The device according to any one of claims 2 to 5 wherein the mixture having a quantity of fluid so that it is flowable.
7. The device according to any one of claims 2 to 6 wherein the heat reflective powder or particulate is one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide.
8. The device according to any one of claims 2 to 7 wherein the powder or particulate is between 10 to 50% of the mixture.
9. The device according to any one of claims 2 to 8 wherein the powder or particulate is of paint grade particle size.
10. The device according to any one of claims 2 to 9 wherein the thickening agent is between 30 to 90% of the mixture.
11. The device according to any one of claims 1 to 10 wherein the thickening agent is one or a combination of two or more materials selected from bentonite, attapulite and celluloses.

12. The device according to claim 6 wherein the fluid is added to a quantity so that the mixture is of a flow quality that allows the device to provide a therapeutic effect on the foot when the sac is pressed.
13. The device according to any one of claims 1 to 12 wherein the device is formed to be generally in the shape of a foot and the sac extending from about the heel region to about the toe or ball region of the foot.
14. The device according to claim 13 wherein the first and second layers are flexible and made of an impervious material.
15. The device according to claim 14 wherein the impervious material is Polyurethane or another plastic material.
16. The device according to any one of claims 13 to 15 wherein the device is reversible so that either surface of the first and second layers can be used.
17. The device according to any one of claims 13 to 16 wherein the layers are sealingly joined around the edges thereof by adhesive, fusion, welding or any other known technique.
18. The device according to claim 17 wherein radio frequency (RF) welding is employed for the joining the edges.
19. The device according to claim 17 or 18 wherein the sac is also formed during joining of the edges and the sac extending to about the ball region
20. The device according to claim 19 wherein the device having an additional joint extending substantially laterally in the ball region.
21. The device according to any one of claims 1 to 20 wherein the device is a sole or a removable inner sole for the footwear.
22. The device according to claim 21 wherein the sole or the inner sole having spaced markings for different shoe sizes so that it can be trimmed according to a marking for a desired size.



ABSTRACT

A heat reflection device for footwear includes a first layer of fluid-impervious material, a second layer of fluid-impervious material and a sac arranged between the first and second layers. The sac contains a heat reflective material therein. In use the device is positioned in relation to the sole of the footwear so that at least some heat conducted or converted through the sole is reflected away from the foot of the wearer of the footwear. The heat reflective material may be a mixture of heat reflective powder or particulate, thickening agent and fluid. The heat reflective powder or particulate may be one or a combination of two or more materials selected from titanium dioxide, zirconium and zinc oxide.

1/2

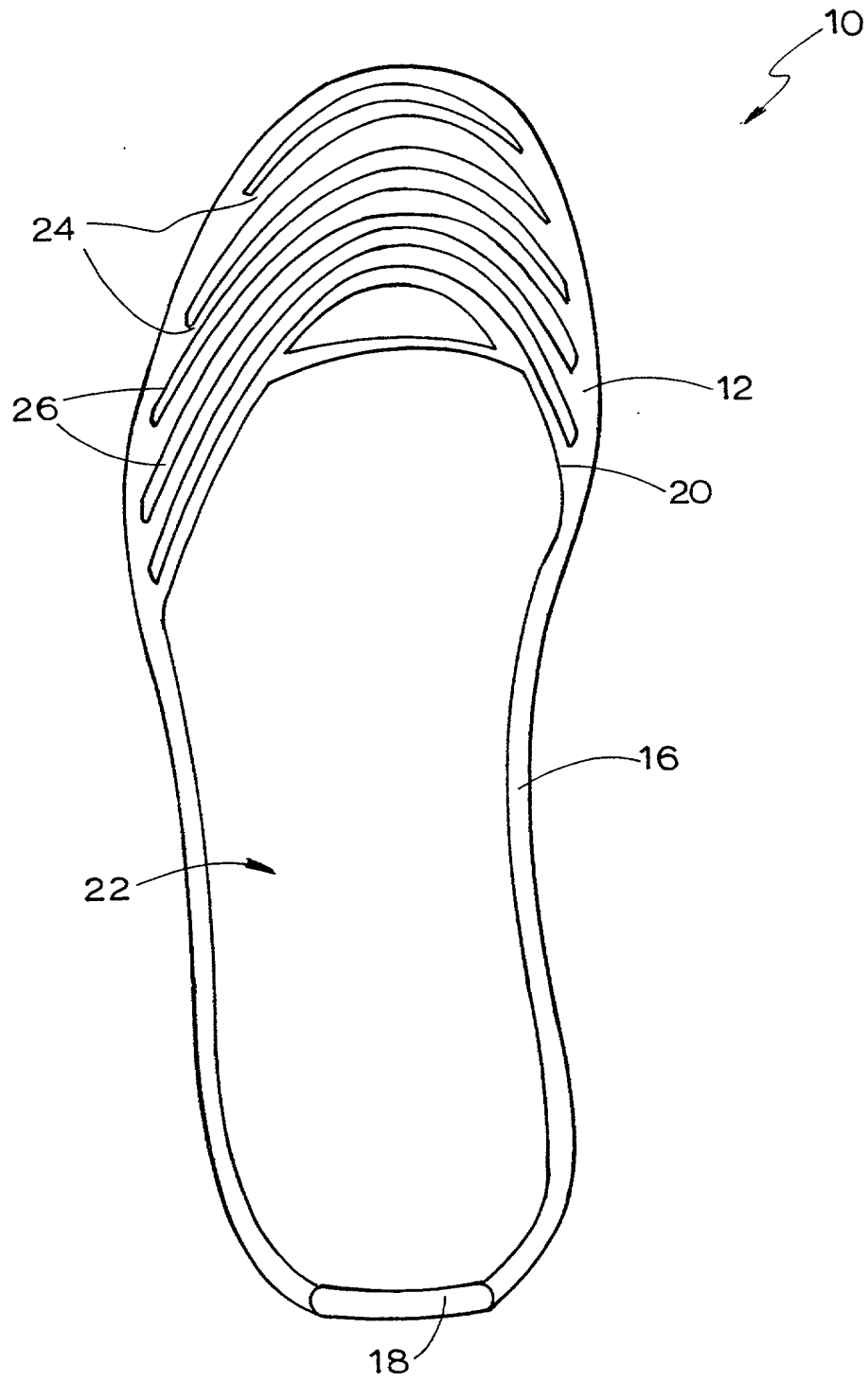


FIG.1.

105660" 25441600

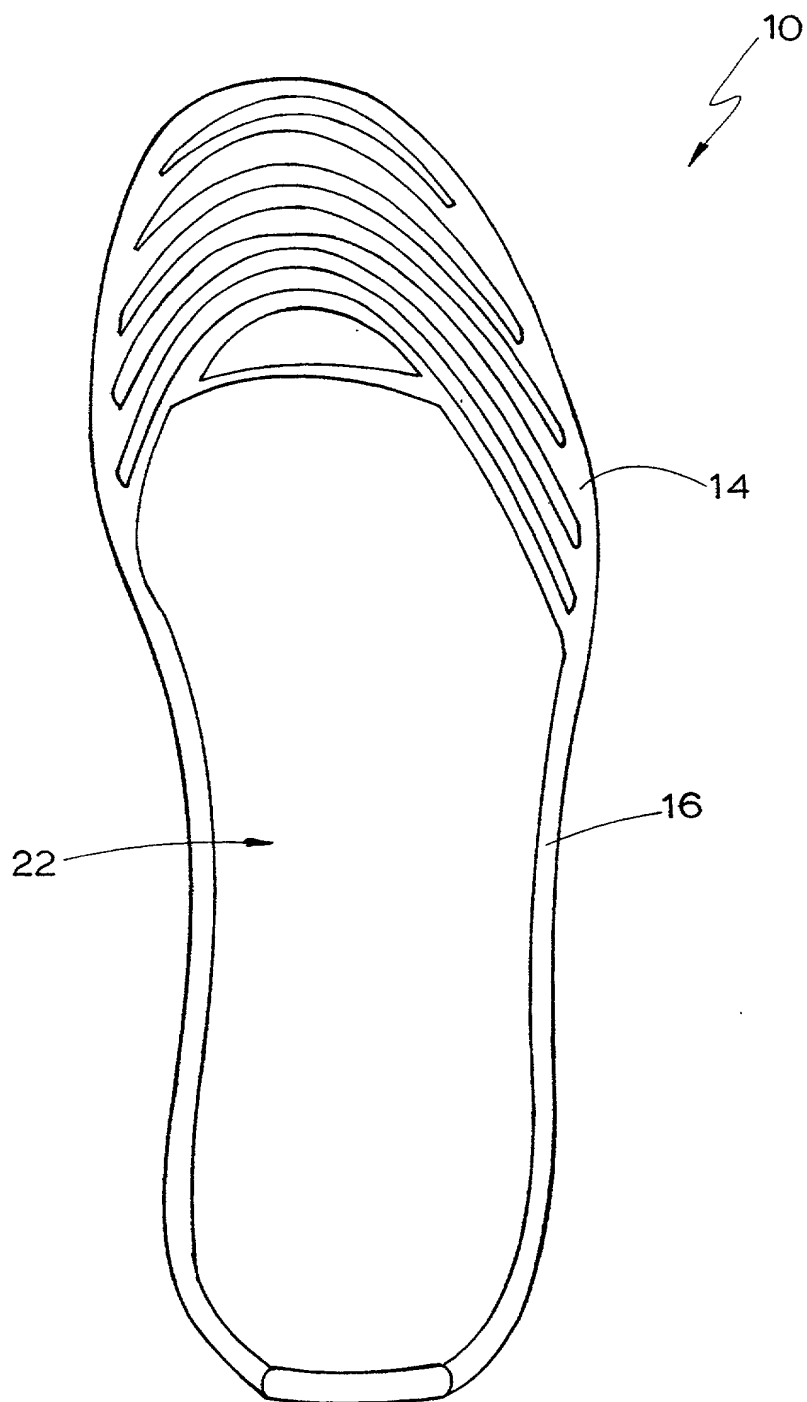


FIG.2.

FIG. 2

# COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

the specification of which: *(check one)*

### REGULAR OR DESIGN APPLICATION

- is attached hereto.
- was filed on \_\_\_\_\_ as application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

### PCT FILED APPLICATION ENTERING NATIONAL STAGE

- was described and claimed in International application No. PCT/AU00/00156 filed on 6 March 2000 and as amended on \_\_\_\_\_ (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

### PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

### PRIOR FOREIGN APPLICATION(S)

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
Australia	PP9055	05.03.1999	Yes

*(Complete this part only if this is a continuing application.)*

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status--patented, pending, abandoned)

POWER OF ATTORNEY

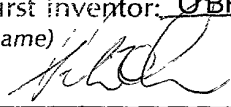
The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from INTELLPRO as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoît CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, and Thomas W. PERKINS, Reg. No. 33,027, c/o YOUNG & THOMPSON, Second Floor, 745 South 23rd Street, Arlington, Virginia 22202.**

Address all telephone calls to Young & Thompson at 703/521-2297.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: O'BRIEN, Peter  
(given name, family name)

Inventor's signature 

Date 27th August 2001

Residence: See below

Citizenship: Australian

Post Office Address: 5/10 Rosewood Avenue, Broadbeach, Queensland, 4218, Australia AUX

Full name of second joint inventor, if any:  
(given name, family name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_

Residence:

Citizenship:

Post Office Address:

Full name of third joint inventor, if any:  
(given name, family name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_

Residence:

Citizenship:

Post Office Address: